



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/618,615	07/18/2000	Gary W. Sinda	6573-62441	9299
23643 7590 11/09/2007 BARNES & THORNBURG LLP 11 SOUTH MERIDIAN INDIANAPOLIS, IN 46204			EXAMINER CHAMPAGNE, DONALD	
			ART UNIT 3622	PAPER NUMBER
			MAIL DATE 11/09/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/618,615	Applicant(s) SINDE, GARY W.	
	Examiner Donald L. Champagne	Art Unit 3622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 3622

DETAILED ACTION

Prosecution Reopened

1. In view of the appeal brief filed on 23 July 2007, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

2. To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37.

The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

3. A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing at the end of this Office action.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 6-9, 11-14, 16-19, 21-24, 26-29, 31-34 and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nickolls et al. (US005251626A).

6. Nickolls et al. teaches (independent claims 1 and 21) a method and apparatus for identifying arrhythmias (abnormal heart rhythms) by monitoring physiological signals (col. 6 lines 5-14) descriptive of heart activity (col. 9 lines 47-48), which reads on identifying a source of

Art Unit: 3622

abnormality within an electrical network, including classifying electrocardiogram (ECG) waveforms (col. 5 lines 48-54), which reads on storing frequency spectra of known arrhythmias/abnormalities (col. 7 lines 3-8 and Figs. 7-9), comparing the input ECG spectra with the spectra of known arrhythmias/abnormalities, and determining from the comparison which of the frequency spectra of known arrhythmias is closest to the input ECG spectra (col. 11 lines 28-38 and Figs. 4 and 5, described at col. 12 line 11 to col. 13 line 65).¹

7. Nickolls et al. does not teach that the abnormality is an ingress into (external to) a network. However, for the following reasons, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to apply the teachings of Nicholls et al. to identifying an abnormality that is an ingress into a network.
8. First, the problems of the instant and reference inventions are analogous. Both inventions comprise storing frequency spectra of known sources of ingress/abnormality, comparing the frequency spectrum of the unknown ingress/abnormality signal to the frequency spectra of known sources of ingress/abnormality, and determining from the comparison which of the frequency spectra of known sources of ingress/abnormality is closest to the frequency spectrum of the unknown ingress/abnormality. The two inventions differ only in that the instant invention identifies an ingress/abnormality that is external to a network while the reference invention identifies an arrhythmia/abnormality that is internal to the heart network. The two inventions are concerned with identifying unknown spectra and do so in the same way, by comparison to known spectra.
9. Second, one of ordinary skill in the art is a graduate engineer familiar with the use of spectral analyzers and related instruments. Such a person is skilled in applying mathematical analogies to diverse problems as well as in analyzing spectra. The application of Nicholls et al. to the instant problem of identifying an unknown spectrum and therefore its source outside of a network is well within the skill of an ordinary practitioner of the engineering art.
10. A declaration is being filed herewith attesting that the examiner has himself applied these principles to identify a source of ingress into a gas turbine power plant. Note from the declaration that no meaningful distinction was made between (ingress) sources external to

¹ MedicineNet.com defines "QRS complex". The heart contains its own network, called the *conduction system* (Frederick et al.) or the *conducting system* (Martini et al.).

Art Unit: 3622

the power plant and sources internal to the power plant. Either external (ingress) or internal sources could have caused the problem. The team of which the examiner was a member investigated both external (ingress) and internal sources simultaneously. One of ordinary skill in the art would not regard the distinction between external (ingress) and internal sources as meaningful. The fact that the reference invention identifies internal spectra would not have dissuaded one of ordinary skill in the art from applying the reference invention to the identification of external (ingress) spectra.

11. The courts have held that a reference may be used to reject a claim if the reference is "reasonably pertinent to the particular problem with which the inventor was concerned" (MPEP § 2104.01(a)). Here Nicholls et al. is applicable because the particular problem is the same, identification of an unknown spectrum.

12. The US Supreme Court has ruled,

"When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill." (*KSR International Co. v. Teleflex, Inc.*, 550 U.S. ___, 82 USPQ2d 1385 (2007))

The reference invention compares an unknown spectrum within the human heart to known spectra so as to identify the unknown spectrum. While the instant invention is not in the same field, it is a predictable variant of the reference invention, and therefore, under *KSR*, barred from patentability by 35 USC § 103. Using the technique of the reference invention is further obvious because comparing an unknown spectrum to known spectra so as to identify the unknown spectrum is not beyond the skill of an ordinary practitioner of engineering.

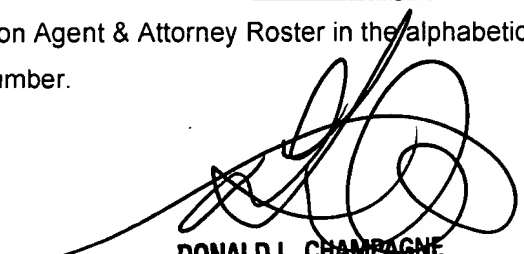
13. Nickolls et al. also teaches (claims 2-4, 6-9, 11-14, 16-19, 22-24, 26-29, 31-34 and 36-39) analog, digital and hybrid analog-digital networks (col. 6 lines 22-23 and col. 11 lines 3-4) and optimization by use of a back propagation neural network (col. 5 lines 48-49).

Art Unit: 3622

14. Claims 5, 10, 15, 20, 25, 30, 35 and 40 are rejected under 35 U.S.C. 103(a) as being obvious over Nickolls et al. in view of Eberhart et al. (US006516309B1). Nickolls et al. does not teach a particle swarm optimizer. Eberhart et al. teaches a particle swarm optimizer (PSO, Abstract and col. 2 line 47 to col. 3 line 10). Because Eberhart et al. teaches that PSO can improve the efficiency of diagnostic neural networks (col. 1 line 64 to col. 2 line 7), it would have been obvious to one of ordinary skill in the art, at the time of the invention, to add the teachings of Eberhart et al. to those of Nickolls et al.

Conclusion


15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald L. Champagne whose telephone number is 571-272-6717. The examiner can normally be reached from 9:30 AM to 8 PM ET, Monday to Thursday. The examiner can also be contacted by e-mail at donald.champagne@uspto.gov, and *informal* fax communications (i.e., communications not to be made of record) may be sent directly to the examiner at 571-273-6717.
16. The examiner's supervisor, Eric Stamber can be reached on 571-272-6724. The fax phone number for all *formal* fax communications is 571-273-8300.
17. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).
18. **ABANDONMENT** – If examiner cannot by telephone verify applicant's intent to continue prosecution, the application is subject to abandonment six months after mailing of the last Office action. The agent, attorney or applicant point of contact is responsible for assuring that the Office has their telephone number. Agents and attorneys may verify their registration information including telephone number at the Office's web site, www.uspto.gov. At the top of the home page, click on Site Index. Then click on Agent & Attorney Roster in the alphabetic list, and search for your registration by your name or number.



DONALD L. CHAMPAGNE
PRIMARY EXAMINER

5 November 2007

Donald L. Champagne
Primary Examiner
Art Unit 3622



ERIC W. STAMBER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600

Declaration of Donald L. Champagne, P.E., Ph.D.

1. I am a graduate engineer. I was awarded a B.S. degree in mechanical engineering from the University of Rhode Island (Kingston, RI) in 1966. I was awarded an M.S. degree in chemical engineering from Rensselaer Polytechnic Institute (Troy, NY) in 1978. I have been registered as a Professional Engineer in the State of Ohio since 1972 (License no. PE 36367). I currently reside at 9802 Forest Grove Drive, Silver Spring MD 20902-5706. I am currently employed as a Primary patent Examiner by the US Patent and Trademark Office in Alexandria VA.
2. From 1973 to 1980 I was employed in a number of capacities by the Gas Turbine Products Division of General Electric Company in Schenectady NY. During 1973 to 1976 my position was Combustion Development Engineer for the company's heavy-duty large gas turbine power plant product. During this period my primary assignment was with a task force working to solve a combustion-driven oscillation problem with the new MS 7001B packaged power plant product.
3. Any flexible body, which includes most things made of metal as well as fluids, can vibrate. When stimulated, any such body preferentially vibrates at some certain "natural frequency" that is governed by properties of the body. This is the principal upon which musical instruments operate. String instruments produce sounds of various pitch or frequency by varying string length. Wind instruments vibrate a body of air, and the pitch or frequency is changed by varying the geometry of this body of air (e.g., by moving the slide of a trombone).
4. In 1973 our combustion-driven oscillation task force focused initially on a power plant installed at McPherson, Kansas. That plant had been forced out of service after only a few hours of operation by the failure of sheet metal parts in the combustion system. Field examination of the parts suggested fatigue failure, which is due to oscillatory forces. Combustion "noise" was known to have caused fatigue failures in rockets and aircraft gas turbine engines, so a similar cause was suspected in the McPherson machine. It was our job to identify the source of this suspected combustion-driven oscillation.
5. We did so by first instrumenting the repaired McPherson gas turbine power plant with means, essentially special microphone probes, to measure gas-phase oscillation. The field instrumentation also included means to electronically record whatever was detected by the

Art Unit: 3622

oscillation probes and means to analyze the oscillation data into a frequency spectrum (a plot of amplitude versus frequency). The frequency spectra of the gas turbine in operation quickly revealed a high-amplitude (6 psi peak-to-peak) component at a frequency of 86 Hz. It then became our job to identify the source of this oscillation at 86 Hz.

6. We considered both internal sources as well as external sources (ingress sources) by gathering spectra of known sources of oscillation. In some cases these sources were known from physical theory. For example, some engineers calculated the natural frequencies of various fluid and solid bodies within the combustion system. Other engineers gathered spectra of external sources. For example, I personally visited the gas fuel supplier to learn if their compressors or other components upstream of the McPherson power plant were capable of generating a significant oscillation at or near 86 Hz.
7. By this process of comparison and elimination, it was ultimately determined that the source of the damaging 86 Hz oscillation was the gas body within the main cylindrical combustion chamber itself. Its theoretical natural frequency was near 86 Hz, and its spectrum shifted with operating conditions (due to changes in the mean temperature of the gas body) as predicted by theory. The problem was ultimately solved by making changes within the combustion chamber to reduce the magnitude of the oscillation and by reinforcing the downstream component that had been failing.



Donald L. Champagne

5 November 2007